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Section I. (Pending Claims)

This listing of claims replaces all prior versions and all prior listings of claims in the application. As set forth below, claims 1 and 14 have been amended and new claims 31 and 32 have been added.

1. (Currently amended) A semiconductor manufacturing process facility requiring use therein of air exhaust for its operation, said facility including clean room and gray room components, with said clean room having at least one semiconductor manufacturing tool therein, and wherein air exhaust is flowed through a discrete volumetric region of said clean room, said discrete volumetric region containing said at least one semiconductor manufacturing tool, whereby heat and other contaminants emanating from said at least one semiconductor manufacturing tool are captured by said air exhaust flow, said facility comprising at least one discharge duct positioned so as to provide effective hydrodynamic flow-through of the contaminated air exhaust into the discharge duct and an air exhaust treatment apparatus arranged to (i) receive said contaminated air exhaust from the discharge duct after flow thereof through said discrete volumetric region of said clean room, (ii) produce a treated air exhaust suitable for discharge into the ambient air of the facility, and (iii) recirculate the treated air exhaust to an ambient air environment of the facility.
2. (Previously presented) The semiconductor manufacturing process facility of claim 1, wherein said discrete volumetric region includes a region selected from the group consisting of process tool housings, cabinets, fume regions, abatement units, and containment enclosures, and wherein the treated air exhaust is discharged from the air exhaust treatment apparatus to the gray room of the facility.
3. (Original) The semiconductor manufacturing process facility of claim 1, wherein the exhaust treatment apparatus comprises a chemical filter arranged for contacting air exhaust to remove contaminant species therefrom.
4. (Original) The semiconductor manufacturing process facility of claim 3, wherein the exhaust treatment apparatus comprises an air filter arranged for contacting air exhaust to remove particulate material therefrom.

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5. (Original) The semiconductor manufacturing process facility of claim 4, wherein the chemical filter is upstream of the air filter.
6. (Original) The semiconductor manufacturing process facility of claim 1, wherein the exhaust treatment apparatus comprises a heat exchanger arranged to cool air exhaust flowed therethrough.
7. (Original) The semiconductor manufacturing process facility of claim 3, wherein the exhaust treatment apparatus comprises a heat exchanger arranged to cool air exhaust flowed therethrough.
8. (Original) The semiconductor manufacturing process facility of claim 4, wherein the exhaust treatment apparatus comprises a heat exchanger arranged to cool air exhaust flowed therethrough.
9. (Original) The semiconductor manufacturing process facility of claim 1, comprising a house exhaust system, wherein the air exhaust is not flowed through the house exhaust system.
10. (Original) The semiconductor manufacturing process facility of claim 1, wherein the at least one semiconductor manufacturing tool includes an ion implanter.
11. (Original) The semiconductor manufacturing process facility of claim 1, wherein the at least one semiconductor manufacturing tool includes a gas cabinet.
12. (Original) The semiconductor manufacturing process facility of claim 1, wherein the at least one semiconductor manufacturing tool includes a point-of-use abatement tool.
13. (Original) The semiconductor manufacturing process facility of claim 1, wherein the exhaust treatment apparatus includes a toxic gas monitor.
14. (Currently amended) A method of operating a semiconductor manufacturing process facility requiring use therein of air exhaust for its operation, said facility including clean room and gray room components, with said clean room having at least one semiconductor

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manufacturing tool therein, and wherein air exhaust is flowed through a discrete volumetric region of said clean room, said discrete volumetric region containing said at least one semiconductor manufacturing tool, said method comprising the steps of flowing the air exhaust through or past the at least one semiconductor manufacturing tool whereby heat and other contaminants emanating from said semiconductor manufacturing tool are captured by said air exhaust, treating the so contaminated air exhaust after flow thereof through said discrete volumetric region of said clean room to produce a treated air exhaust suitable for discharge into the ambient air of the facility, and recirculating the treated air exhaust to an ambient air environment of the facility.

15. (Previously presented) The method of claim 14, wherein said discrete volumetric region includes a region selected from the group consisting of process tool housings, cabinets, fume regions, abatement units, and containment enclosures, and wherein the treated air exhaust is discharged to the gray room of the facility.
16. (Original) The method of claim 14, wherein the treating comprises chemical filtering of the air exhaust.
17. (Original) The method of claim 14, wherein the treating comprises mechanical air filtering of the air exhaust.
18. (Original) The method of claim 14, wherein the treating comprises cooling the air exhaust.
19. (Original) The method of claim 14, wherein the semiconductor manufacturing process facility includes a house exhaust system, wherein said air exhaust is not flowed through the house exhaust system.
20. (Original) The method of claim 14, wherein the at least one semiconductor manufacturing tool includes an ion implanter.
21. (Original) The method of claim 14, wherein the at least one semiconductor manufacturing tool includes a gas cabinet.

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22. (Original) The method of claim 14, wherein the at least one semiconductor manufacturing tool includes a point-of-use abatement tool.
23. (Original) The method of claim 14, further comprising monitoring the air exhaust with a toxic gas monitor.
24. (Previously presented) The semiconductor manufacturing process facility of claim 1, wherein said discrete volumetric region is selected from the group consisting of:
 - (a) process tool housings;
 - (b) abatement units;
 - (c) cabinets; and
 - (d) containment enclosures.
25. (Previously presented) The semiconductor manufacturing process facility of claim 24, wherein the air exhaust comprises sweep gas air flowed through said discrete volumetric flow region.
26. (Previously presented) The semiconductor manufacturing process facility of claim 1, wherein said discrete volumetric region comprises an ion implanter enclosure containing a gas box and flow circuitry, and said ion implanter enclosure is arranged for flow of said air exhaust therethrough to remove heat and sweep out any leakage of contaminant species from the gas box and flow circuitry.
27. (Previously presented) The semiconductor manufacturing process facility of claim 3, wherein said chemical filter comprises a chemisorbent.
28. (Previously presented) The semiconductor manufacturing process facility of claim 27, wherein said chemisorbent is chemically reactive with at least one gas species selected from the group consisting of hydrides, halides, acid gases and organometallic reagents.
29. (Previously presented) The semiconductor manufacturing process facility of claim 1, wherein the discrete volumetric region through which said air exhaust is flowed comprises

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at least one of (i) a process tool containment enclosure, (ii) a point-of-use abatement tool, and (iii) a gas cabinet.

30. (Previously presented) The semiconductor manufacturing process facility of claim 1, wherein said air exhaust is flowed through the discrete volumetric region to remove heat therefrom.
31. (New) A semiconductor manufacturing process facility requiring use therein of air exhaust for its operation, said facility including clean room and gray room components, with said clean room having at least one semiconductor manufacturing tool therein, and wherein air exhaust is flowed through a discrete volumetric region of said clean room, said discrete volumetric region containing said at least one semiconductor manufacturing tool, whereby heat and other contaminants emanating from said at least one semiconductor manufacturing tool are captured by said air exhaust flow, said facility comprising an air exhaust treatment apparatus arranged to (i) receive said contaminated air exhaust after flow thereof through said discrete volumetric region of said clean room, (ii) produce a treated air exhaust suitable for discharge into the ambient air of the facility, and (iii) recirculate the treated air exhaust to an ambient air environment of the facility wherein said treatment apparatus comprises an air filter alone in combination with a chemical filter, a heat exchanger, or both.
32. (New) The semiconductor manufacturing process facility of claim 31 further comprising monitoring and detection devices for ensuring the suitability of the treated air exhaust for discharge into the ambient air environment of the facility.